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WESTERN BIRDS

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THE NESTING BIOLOGY OF THE HOUSE FINCH IN HONOLULU, HAWAII

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The House Finch, *Carpodacus mexicanus frontalis* (Say), is a small seed-eating passerine found throughout western North America. It was introduced to Hawaii, probably from San Francisco as an escaped cage-bird, prior to 1870 (Grinnell 1911). Today it is found on all the main Hawaiian islands.

This was a field study of the nesting biology of the House Finch from January 1972 through July 1974, covering three nesting seasons. Some of the findings are discussed in relation to what is known about House Finch populations in North America.

METHODS AND STUDY SITE

Most of the study consisted of field observations, with almost daily checks of nests. Measurements were made using a caliper, ruler, or tape measure. Weights were obtained using Pesola scales. To facilitate future identification, eggs were marked with a black "Sharpie" pen; nestlings were marked in 1972 with red nail polish, but in 1973 and 1974 with a red Sharpie pen, which proved more satisfactory. Nestlings near fledging and adults were banded with U.S. Fish and Wildlife Service metal bands and one or two plastic bands in different color combinations. Unless otherwise indicated calculations are in the form mean ± one standard deviation. The 0.05 value is considered the level of rejection.

The study site was confined to the University of Hawaii 0.4 km² main campus, located in Manoa Valley, a residential area in Honolulu.

The House Finch is one of about 15 bird species found on or near the campus. All are introduced except the migratory and nonnesting Golden Plover (*Pluvialis dominica*). From 25 to 50 pairs of House Finches nest on campus at any one time, the nesting season covering about six months from mid-February through August. The breeding season is followed from late July-August through October by a molting period.

THE NEST

In 1972 I found 91 nests, in 1973 103 nests, and in 1974 63 nests, under construction, with eggs or young. Nests do not usually persist from one year to the next or even through one nesting season; House Finches build new nests for each effort. Because House Finches do not defend very large territories, usually at the most only the small areas around the active nests, nests are often in close proximity to nests of other House Finches and bird species.

The 257 nests that I found were built in 26 different types of vegetation. Pandanus (*Pandanus*) and palms (*Palmae*) were the most common nesting trees, with 41.2% and 28.0% of the total number of nests, respectively. Monkeypod (*Samanea saman*) with 7.4% and Fiddlewood (*Citharexylum spinosum*) with 6.6% were other frequently used trees. Nests usually were constructed on sites providing cover and shade, such as in clusters of pandanus leaves, on stems or axes of palm leaves, or in foliage located in the outer portions of trees.

The height of a nest was measured from the bottom of the nest to the ground below if the nest was lower than 4.6 m or estimated as closely as possible if higher. Heights were variable, ranging from 1.8 to 15.0 m, with an average in 1972 of 4.3 $\pm$ 1.5 m, in 1973 of 5.0 $\pm$ 2.4 m, and in 1974 of 4.6 $\pm$ 1.6 m.

Nest construction takes from 6 to 22 days, averaging 11.8 $\pm$ 4.7 days for 15 nests. Nest building is done almost exclusively by the female. Only material brought to the nest by the female is used, and the male aids the female in molding the nest only in the first half of the nest-building period. Thereafter only the female works on the nest, the male accompanying the female to and from the site, singing from a nearby perch. Preparation of the site, such as enlarging it by nibbling away adjacent leaves, takes the first one or two days of nest building. Then the foundation is laid down and the nest is molded into shape. At this stage larger-sized material is used, such as old Fiddlewood inflorescences, fibrous strips of Coconut (*Cocos nucifera*) and pandanus, fresh and dried grasses and leaves, string, paper strips, and feathers. The cup lining is finally added, consisting of fine and soft coconut fibers, hair, and frayed cigarette filters.

The finished cup-shaped nest varies from a rather loose to a very compact structure. Nest dimensions of 25 nests measured in 1973 were (in cm): outer width x length, 9.5 ± 1.3 x 12.0 ± 3.3; inner width x length, 5.5 ± 0.6 x 6.2 ± 0.6; outer cup depth, 7.3 ± 1.7; inner cup depth, 4.2 ± 0.8; and rim thickness from 1.0 ± 0.6 to 4.7 ± 2.8.

EGGS AND CLUTCH SIZE

Copulation occurs at the invitation of the female and is seen, at the earliest, a few days before nest building is completed. I have never seen male courtship display lead immediately to a copulatory attempt.

Egg laying usually starts the day after nest building ends, although I observed a female adding material to a 1974 nest that contained at least three eggs. The first egg, and most probably the entire clutch, is laid in the early morning hours, before 08:00. Usually one egg per day is laid until the clutch is completed. Out of a total of 44 nests, only five had a day or more skipped in the laying of the clutch. In no case was more than one egg laid per day.

House Finch eggs are colored light blue, with black or brown-black specks or lines concentrated at the rounded ends. Egg measurements were taken only from nests that were found on or before the day the first eggs were laid and where the clutches were completed. Eggs were measured and weighed the day they were laid. Based on 197 eggs from 48 nests from the three study years, greatest width x length and weight averaged 13.5 ± 0.6 x 19.1 ± 0.9 mm and 1.89 ± 0.15 g, respectively. Eggs within a clutch do not show significant differences in weight whether they were laid first, second, third, fourth, or fifth in a clutch, in small or large clutches, or early or late in the nesting season (one-factor anovas, $P>0.05$).

Bergtold (1913) gave measurements of House Finch eggs from Denver, Colorado, that averaged 13.7 x 19.6 mm, somewhat larger than my measurements. The larger eggs from Denver also were heavier in weight. Based on two clutches containing four and five eggs, an egg weighed 2.25 ± 0.08 g. There is a significant difference in the weights of the eggs from Denver and Honolulu (two-tailed t-test, $t = 7.030$, d.f. = 204, $P<0.001$). Without other information, such as the availability of food for the House Finch populations on campus for the past three years and in Denver during the early 1900s, no adequate explanation is possible.

Clutch size on campus averaged about four eggs and does not differ significantly from those reported from Arizona and California (two-tailed t-tests, $P>0.05$; Table 1). Only papers that have information amenable for statistical comparison are used in Table 1. Hensley's (1959) data were slightly modified in that I used n = 11, instead of his

Table 1. Clutch sizes for House Finches

	ARIZONA	CALI-FORNIA	CALI-FORNIA	HAWAII
RANGE	3-5	3-6	4-6	2-5
MEAN	4.0	4.3	4.4	4.2
STANDARD DEVIATION	0.4	0.9	0.6	0.6
NO. OF NESTS	11	18	25	127
SOURCE	Hensley (1959)	Grinnell and Linsdale (1936)	Evenden (1957)	This Study

n = 12, because one of the clutch sizes could not be determined from the paper. Also Grinnell and Linsdale (1936) caution that the four nests that they found with 3-egg clutches may have been incomplete.

THE INCUBATION PERIOD

The incubation period, the length of time between the laying of the last egg in the clutch until that egg hatches when all the eggs hatch, ranged from 11.5 to 13.5 days, averaging 12.8 $\pm$ 0.6 days for 29 nests. Clutch sizes of the nests used to calculate the incubation period ranged from two to five, but did not affect the length of the incubation period (one-factor anova, $F = 3.37$, $m/n = 3/25$, $P = 0.1\text{-}0.05$). The incubation period in Hawaii does not differ from the length of 13.3 $\pm$ 1.1 days (based on 11 nests) determined by Evenden (1957) at Sacramento, California (two-tailed t-test, $t = 1.887$, d.f. = 38, $P = 0.1\text{-}0.05$). Because of water evaporation, a House Finch egg loses 15.9 $\pm$ 6.1% of its original weight before hatching (based on 58 eggs from 22 nests).

An egg pips, at the earliest, less than 24 hours before the young hatches. Hatching may occur at any hour of the day or night, and the eggs of a clutch hatch out over a period of days and not all on one day. In rare instances one young may hatch each day until all the young have emerged. Usually two young hatch on the first day of hatching and one young per day thereafter until all the young have hatched. I have never found all the eggs of a clutch hatching on the same day. Eggs also hatch in the order that they are laid. In six cases where only one young hatched on the first day of hatching and where the entire clutch eventually hatched, the first egg laid was the one that hatched first. In nine other cases, where more than one young hatched on the first day, the remaining eggs in the clutches hatched in the order in which they were laid. The female gets rid of the egg pieces either by flying off with them or eating them at the nest.

Based on the hatching information and on temperature-probe readings at two 1973 nests, incubation, the application of heat to the eggs by the adult House Finch, possibly starts by the night the first egg of the clutch is laid and almost certainly by the second night, and not when the penultimate or last egg is laid, as in some other bird species.

THE NESTLING PERIOD

At hatching, a House Finch is helpless and blind, with some fluffy whitish down on the head and body. A chick fledges, or leaves the nest, 14 to 19 days after hatching, averaging in 1972 16.8 ± 1.1 days (based on 12 young from six nests) and in 1973 18.5 ± 1.0 days (based on 24 young from eight nests). By this time the young is rather fully feathered, with a short, stubby tail, only a few strands of down adhering to the head feathers, and distinctively swollen beak corners.

Nestlings are fed regurgitated seeds. Nestlings from 15 nests in 1972 and 28 nests in 1973 were weighed daily or almost daily. Figure 1 shows the mean weight ± two standard deviations of a nestling from day 0 (the day the young hatches) until day 13. There is no significant difference between 1972 and 1973 in the weights for the respective days (two-tailed t-tests, $P>0.05$). There is a steady increase in body weight of a chick from less than two g on the day of hatching to about 17 g, 13 days later. Although I could not obtain weights beyond day 13 without frightening the young prematurely from the nest, in two cases in 1973 a just-fledged young, 19 days old, and a chick, 18 days old and a day away from fledging, both weighed 19.0 g, suggesting that a House Finch nestling probably increases in weight to approximately that of an adult, 19.5 ± 1.6 g (based on weights, ranging from 16.9 to 23.8 g, of 43 adults trapped in 1973, with no difference in male and female body weights; two-tailed t-test, $t = 1.575$, d.f. = 41, $P = 0.4\text{-}0.3$).

At Denver, Colorado, Bergtold (1913) weighed eight young from two nests. At one nest four young hatched on the same day; at the other nest two nestlings hatched on the first day, one each on the second and the third days. Seven young took from 14 to 16 days to fledge; it is unclear if the eighth chick fledged. Figure 1 shows the average weight of a Denver nestling. The Colorado chicks weigh significantly more at hatching and through day 9 than the Hawaiian nestlings, but from day 10 to 13 there are no differences in the weights of the young from either localities (two-tailed t-tests). The fact that the nestlings from Denver and from Honolulu weighed the same by nestling day 13 would seem to indicate that the different growth curves were not affected by the food supply for the nestlings. The Denver young, however, hatched from eggs that were significantly heavier than those from which the Honolulu chicks hatched, and it may be that the rate of growth of a

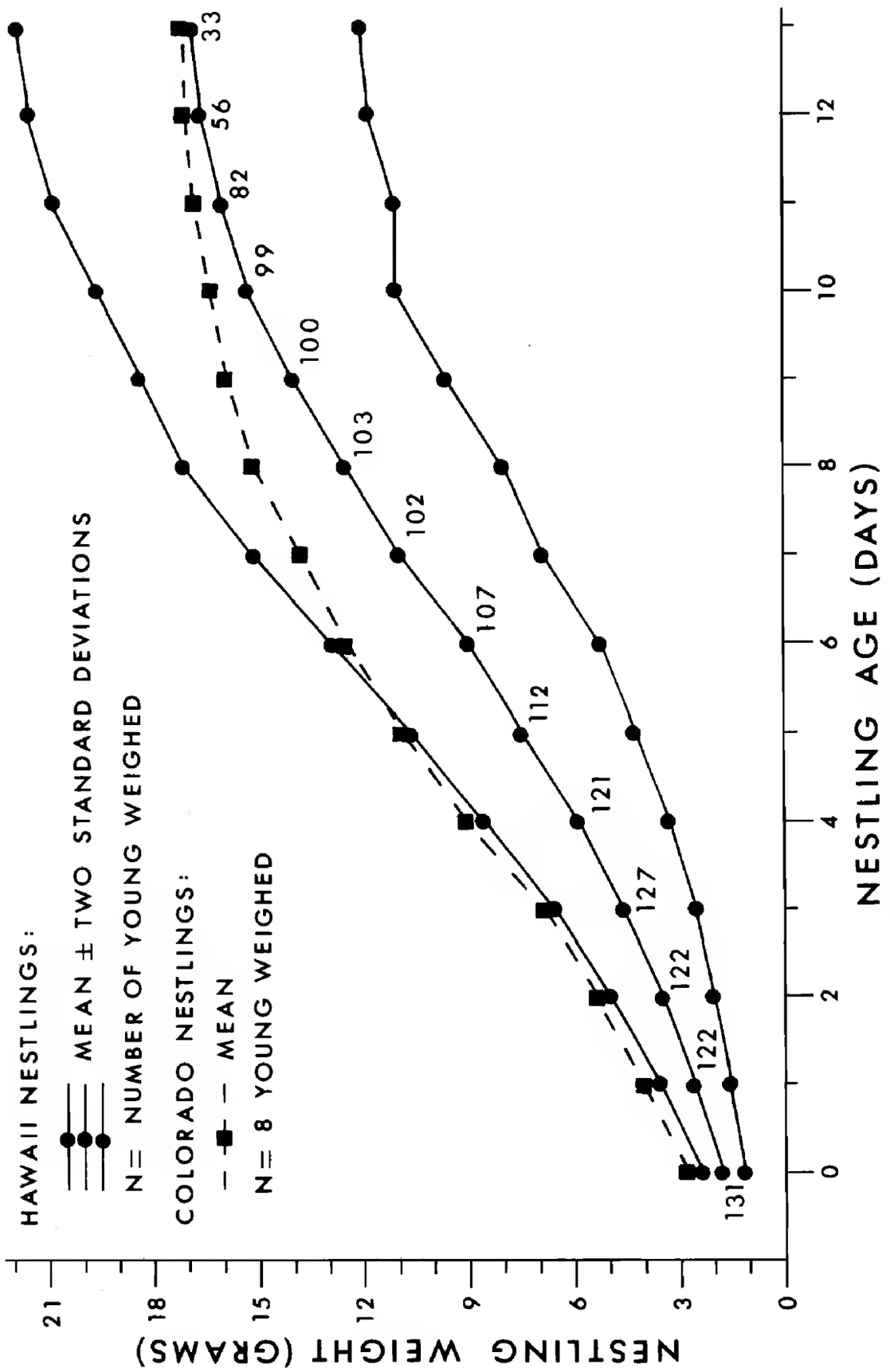

Figure 1. Weights of House Finch nestlings in Hawaii and Colorado.

nestling is affected by the weight of the egg. Schifferli (1973) had similar growth patterns when he compared weight developments of Great Tit (*Parus major*) nestlings hatched from heavy eggs with those young hatched from light eggs, concluding that egg weight can affect the rate of growth.

Because House Finch young hatch over a period of days and not all on the same day, there are differences in chick weights early (days 2 and 3) and later (days 9, 10, and 11) in the nestling period; older young, those that hatched on the first and second days of the hatching period, weigh more than their younger siblings, those that hatch on the third and fourth days (one-factor anovas, $P<0.05$). Early in the nestling period, the eyes of the older young open before their still sightless and younger broodmates, giving the older chicks an advantage in being able to direct their gapes toward the feeding adult and possibly getting more of the food. Later in the nestling period, the older young are larger, more vigorous at feeding than their younger chickmates, and thus probably get more of the food. Although there seems to be some degree of sibling competition for food brought by the adults, in most cases House Finch nestlings that hatched later usually also survived to fledge.

THE FLEDGLING PERIOD

The young fly well when they leave the nest and seem to move out of the nesting area soon thereafter. A brood may fledge all in one day or over a number of days and seem to do so in the morning hours. Based on limited data, fledglings are fed by both adults for at least two weeks and probably are independent after three weeks. The adult pair then renests. Even with a six month nesting season in Hawaii, most likely only two broods can be raised successfully in one season by a pair because of the long nesting period (about two months, including 20 days before renesting) and the low nesting success that I found. In North America two broods in one season seem to be average for the House Finch (Evenden 1957, Gill and Lanyon 1965, Hensley 1954).

ADULT NESTING BEHAVIOR

Daily or almost daily observations of 60-minute duration in 1972 and 1973 at 9 nests during the egg-laying period, 23 nests during the incubation period, and 25 nests during the nestling period indicate that only the female House Finch incubates the eggs and broods the young. She is attentive at the nest during the daylight hours about 50% of the time on the day the first egg is laid and 90% of the time after the clutch is completed and until the eggs hatch. Nest attentiveness then declines

until 10 days after the young hatch, whereafter day brooding is infrequently observed. Night brooding ends about 12 to 14 days after the young hatch.

The male is seen at or near the nest about once an hour during the incubation period, returning to courtship-feed the female regurgitated seeds. Except in one case, males were not observed at the nests at sunset or night, and it may be that they roost together elsewhere during the nesting period, as reported by Evenden (1957).

House Finch nestlings are fed by both the male and the female; also during the first one-third of the nestling period the male feeds the female at the nest and she, in turn, feeds the nestlings. It is rare when no feedings occur during a 60-minute period and as many as four feeding trips may be made, averaging about two feedings per hour. The usual pattern in feeding the nestlings is for the adults to alternate in returning to the nest. Out of 30 feedings noted at 13 1973 nests where the young were more than seven days old, only four consecutive ones were by the same adult and only three feedings were within one minute of each other; times between feedings ranged from 1 to 38 minutes and averaged 16.7 ± 12.0 minutes.

NEST SANITATION

The House Finch belongs to the Carduelinae, a subfamily in which some of the species do not remove the fecal sacs of the young from the nest, a behavioral trait unusual for passerine birds. During the early part of the nestling period, both the male and the female remove the sacs, usually by eating them or, very rarely, by carrying them away. The first sacs appear on the rim from four to nine days after the first young hatch, averaging 6.1 ± 1.3 days (based on 29 nests inspected daily in 1972 and 1973). Especially when three or four young fledge, the nest rim may be covered with fecal matter, although the cup itself is often clean, partly because the older nestlings raise their cloacal regions over the rim when passing fecal sacs.

This fecal matter makes for an ideal "home" for many other animals, especially arthropods. Using the Tullgren-funnel method, the nest faunas from three 1972 nests were extracted and identified, revealing a combined total of 17 different types of animals. The most interesting animal found is a blood-sucking mite (*Mesostigmata:Dermanyssidae*). It was present at every nest I found, ranging from being scarcely noticeable to literally covering the nest and the nestlings. Because the chicks gained weight and fledged even at those nests where the mite populations were in the thousands, I do not believe that this mite is a direct cause of nestling mortality. The mites, though, may so weaken the

young that its chance of survival is greatly reduced after fledging. Bergtold (1913) collected a similar mite.

NESTING SUCCESS

Nesting success may be defined in a number of ways. In this paper nesting success is defined as the proportion of the number of young that fledge in relation to the number of eggs that are laid; hatching success as the proportion of the number of young that hatch in relation to the number of eggs that are laid; and nestling success as the proportion of the number of young that fledge in relation to the number of young that hatch. No nests were considered in computing nesting success where even one egg or young was lost, or believed lost, by my actions or by others. Also, only nests that were found before hatching began are included.

Table 2 lists nesting success for House Finch populations in Honolulu and North America, primarily urban and suburban environments. A number of the studies were done for more than one year, but for ease of computation a combined nesting success is given for each locale. Nesting success in Hawaii for the three seasons is 21.7% and compares similarly with the finding of West (1972) in New Mexico, but is significantly lower than in the other locations (2x2 X^2 tests). The higher nesting successes of Evenden's (1957) and Hensley's (1954) House Finch populations result from both higher hatching and nestling successes. The House Finch in Hawaii has a much lower nesting success than most other populations. In fact, nesting success for the Hawaiian House Finch is far lower than the 46% calculated by Nice (1957) for temperate altricial species. It is closer to the 30% found by Skutch (1966) for Central American species that build open or roofed nests. Although the nesting success of the Hawaiian House Finch is low, it is an abundant bird.

A total of 403 eggs or young were lost in the three study years. Nest losses were due to: strong winds knocking eggs and young from nests (34.7% of the total losses); predation, probably by a rat species, on eggs, young, and in six cases the nesting females (27.5%); failure of eggs to hatch because they were infertile, contained dead embryos, or were deserted (17.4%); and nestlings dying because they were inherently weak at hatching, starved to death, or became so entangled in the nest material, especially the hair used to line the cup, that they could not free themselves and were left behind when the rest of the brood fledged (20.3%). To an unknown extent, House Sparrows (*Passer domesticus*) interfere in House Finch nesting by stealing material from active nests, incorporating the material into their own, and probably even killing nestlings by pecking them to death and throwing them out of the nests.

Table 2. Nesting success of the House Finch.

LOCATION & SOURCE	YEARS	NESTS	EGGS LAID	EGGS HATCHED	NESTLINGS FLEDGED	% SUCCESS HATCHING	% SUCCESS NESTLING	% SUCCESS NESTING
New Mexico West (1972)	1	8	28	16	8	57.1	50.0	28.6
Colorado Bergtold (1913)	5	68	283		166			58.7
Arizona Hensley (1954)	2	10	41	33	33	80.5	100	80.5
California Evenden (1957)	5	37	117	80	57	68.4	71.2	48.7
Hawaii (This study)	3	135	515	278	112	54.0	40.3	21.7
1972	1	46	170	88	29	51.8	33.0	17.1
1973	1	46	181	111	55	61.3	49.5	30.4
1974	1	43	164	79	28	48.2	35.4	17.1

Similar House Sparrow interferences are reported from Colorado and California (Bergtold 1913, Evenden 1957).

SUMMARY

The nesting biology of the House Finch, *Carpodacus mexicanus frontalis* (Say), was studied for three nesting seasons on the University of Hawaii Manoa campus. From 25 to 50 pairs of House Finches nest in the study area from February through August, with nest construction taking approximately 12 days, the incubation period 13 days, the nestling period 17 or 18 days, and the fledgling period from two to three weeks. Clutch size averages four eggs, and a pair most likely successfully raises two broods per nesting season. Nesting success in Hawaii is low, 17% in 1972 and 1974 and 30% in 1973.

Findings indicate that the nesting biology of the House Finch in Hawaii does not differ greatly from populations in North America. Significant differences seem to exist, though, in egg weight, nesting success, and possibly in the nestling growth-pattern.

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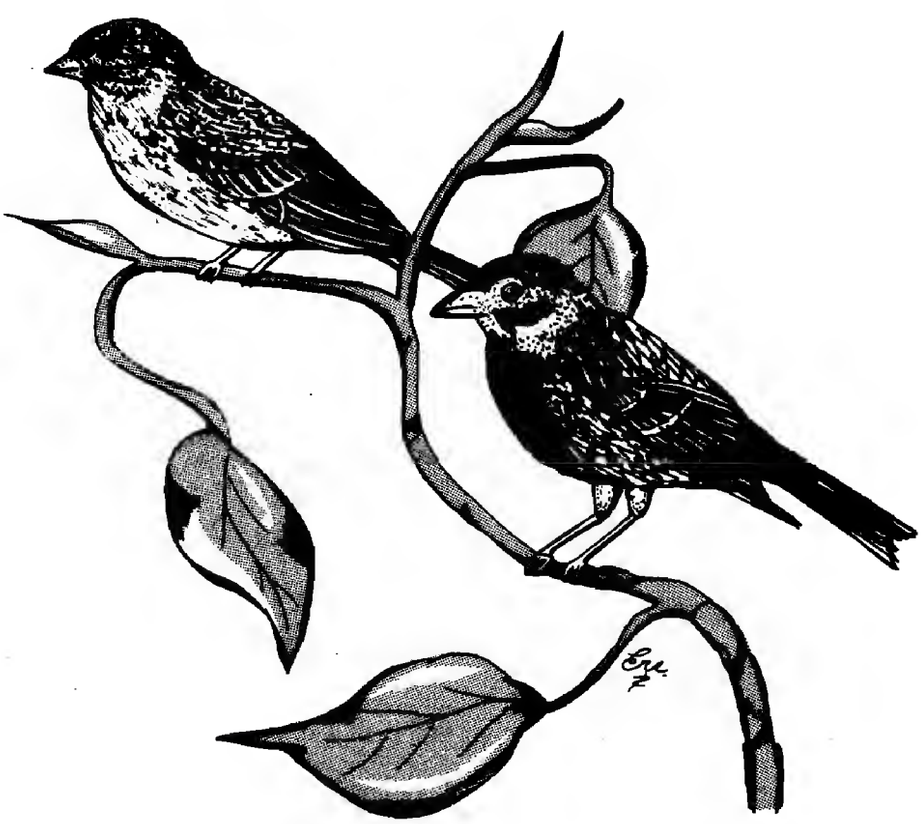

Sketch by Erv Deis

SHOREBIRDS OF THE SACRAMENTO VALLEY, CALIFORNIA

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Shorebird studies in the Central Valley of California have been limited even though the status and ecology of shorebirds along the coast of central California have been well studied (Storer 1951, Recher 1966, Page 1973). Consequently, many of the conclusions regarding shorebirds in central California have been based on information from coastal localities (Grinnell et al. 1918, Grinnell and Miller 1944, McCaskie and DeBenedictis 1966). In recent years, however, shorebird migration in the Sacramento Valley (Figure 1) has come under increased observation. Censuses at the Spreckles Sugar Company settling ponds near Woodland, Yolo County, and at the Sacramento National Wildlife Refuge, Glenn County, have been included in statewide shorebird surveys of the California Department of Fish and Game (Jurek 1973). Many observers have watched the Woodland ponds, in addition to the nearby Woodland and Davis city sewage ponds, during the past fifteen years and have assembled information on shorebird migration in eastern Yolo County. Also, Manolis censused shorebirds at the Chico sewage ponds, Butte County, during spring 1971 and spring and fall 1972.

One possible reason why shorebird data are lacking from the Central Valley is that shorebird habitat is relatively limited. The main feature of the Sacramento Valley is the extensive system of the Sacramento River and its tributaries. Historically these rivers flooded large areas in spring to form marsh and pond habitats for spring migrants. These areas are now under flood control and, therefore, are not as extensive or attractive to shorebirds as they once were. Some native shorebird habitat has been replaced with rice farming, which suffices for some breeding (stilts and avocets) and migrant (curlews, yellowlegs, etc.) species. Numerous vernal pools provide habitat in some areas of the valley and in the adjacent foothills where they are supplemented with farm ponds and reservoirs. Shorebirds such as plovers and curlews also use the plowed fields, pastures and grasslands that make up much of the region. By summer most natural bodies of water, except for the rivers and permanent streams, have dried up, leaving artificial areas such as waste water ponds as the major shorebird feeding areas in fall until winter rains replenish the natural habitats. The largest concentrations of shorebirds in spring are also found at these waste ponds, indicating that they contain more than just the necessary habitat structure to attract shorebirds.

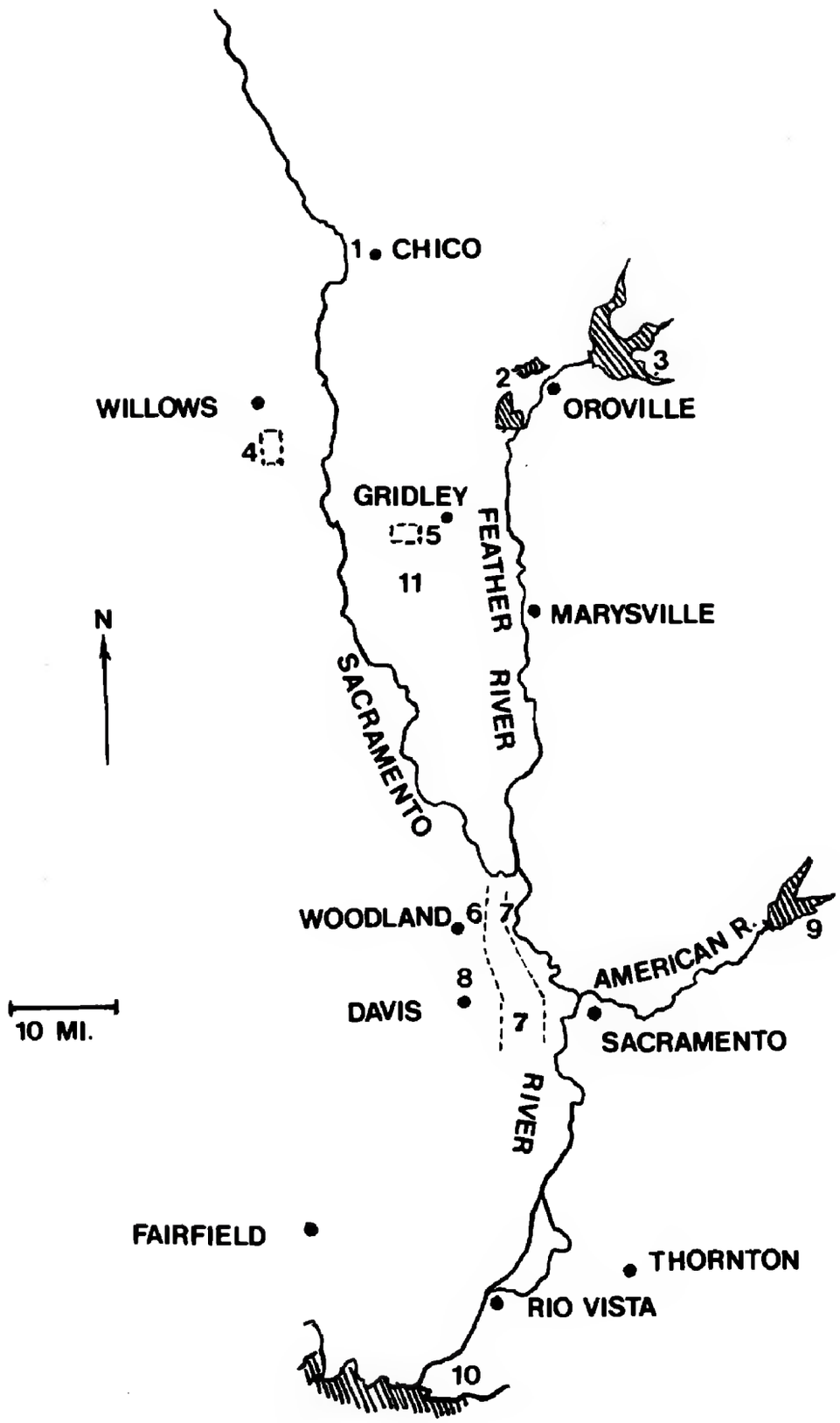

Figure 1. The lower Sacramento Valley. Numbers refer to the following locations: 1) Chico sewage ponds, 2) Thermalito Forebay and Afterbay, 3) Lake Oroville, 4) Sacramento National Wildlife Refuge, 5) Gray Lodge Wildlife Area, 6) Woodland sugar ponds, 7) Yolo Bypass, 8) Davis sewage ponds, 9) Folsom Lake, 10) delta of the Sacramento River and San Joaquin River systems, 11) Sutter Buttes.

SHOREBIRDS

The following annotated list is an attempt to summarize the available data on the status of shorebirds in the Sacramento Valley. It is based primarily upon our notes, but we also used the notes of other observers, particularly Sacramento area birders' observations compiled by Betty Kimball; the literature; and the California Shorebird Surveys (Jurek 1971, 1972, 1973). Because most observations on which this paper is based are from eastern Yolo County, they may not provide an accurate picture for the entire Sacramento Valley. We believe though, from observations elsewhere in the valley, that most of the generalizations apply to the entire valley with the possible exceptions of the northern counties, Shasta and Tehama.

The following abundance terms used here are adapted from Bull (1964) and McCaskie (1970):

Very abundant—over 1000 individuals per day per locality
Abundant—201 to 1000 individuals per day per locality
Very common—51 to 200 individuals per day per locality
Common—21 to 50 individuals per day per locality
Fairly Common—7 to 20 individuals per day per locality
Uncommon—1 to 6 individuals per day per locality
Rare—1 to 6 individuals per season
Very Rare—perhaps regular, but not found every year
Casual—3 to 6 records of occurrence

When data are available and meaningful, extreme early and late dates of the periods of migration for less common migrants are given.

SEMIPALMATED PLOVER *(Charadrius semipalmatus)*: Uncommon to fairly common in spring (10 April to 23 May, peak in late April, early May) and in early fall (28 July to mid-August), rare to uncommon in late fall (mid-August to 21 September), and very rare in winter when confined to the southern end of the valley. This species is far more common along the central California coast than in the valley, especially in fall.

SNOWY PLOVER *(C. alexandrinus)*: A rare spring migrant (1 April to 4 May). Casual in fall (see Appendix). Snowy Plovers have nested twice in eastern Yolo County, at the Davis sewage ponds in 1963 (DeBenedictis and Chase 1963) and at the Woodland sugar ponds in 1970 (Baldridge et al. 1970). This plover was possibly more common in the past in the Sacramento Valley, but was never as common in the Sacramento Valley as in more alkaline areas of the state, such as the San Joaquin Valley (Grinnell et al. 1918). Further nesting in the Sacramento Valley should be looked for.

KILLDEER *(C. vociferus)*: A common to abundant resident, most numerous in fall and winter when it is found in flocks in plowed fields and pastures. In other seasons it is widely distributed in pairs and small groups. Censuses at Woodland indicate a population peak, possibly of migrants, in mid-September (Jurek 1972), but this peak could also represent residents concentrated around the limited water present at that time.

MOUNTAIN PLOVER *(C. montanus)*: Locally fairly common to very common in winter south of the Sutter Buttes (October to mid-May), but found regularly only in eastern Yolo County, in sparsely vegetated fields.

AMERICAN GOLDEN PLOVER *(Pluvialis dominica)*: A very rare fall migrant. There are two winter records (see Appendix). This species is usually found with Black-bellied Plovers in fields and pastures.

BLACK-BELLIED PLOVER *(P. squatarola)*: Fairly common to abundant in spring (late February to April) nearly throughout the valley, although records are lacking for the region east of the Sacramento River and north of Marysville. Abundant in fall (late July to October, peak in mid-September) and fairly common in winter in the valley south of the Sutter Buttes; casual north of there in these seasons. A few may oversummer as occasionally one or two have been found at the Woodland sugar ponds in this season. This species is found primarily in grassy fields, pastures and, to a lesser extent, at ponds.

RUDDY TURNSTONE *(Arenaria interpres)*: A casual fall migrant (see Appendix), this species has been found almost annually in recent years.

COMMON SNIPE *(Capella gallinago)*: Uncommon in spring (mid-February to May, peak in early March), fairly common in fall (mid-August to November, peak in early November), and uncommon in winter. Snipe are found primarily along sloughs and in wet fields and pastures.

EUROPEAN JACKSNIPE *(Lymnocryptes minimus)*: There is one record, the only one for California, of a bird collected near Gridley, Butte County, on 20 November 1938 (McLean 1939).

LONG-BILLED CURLEW *(Numenius americanus)*: Very common to abundant in spring (March to May, peak in late March) and abundant in fall (late June to October, peak in mid-September). An abundant winter resident from Butte County south. In the Sacramento Valley, these birds prefer fields and pastures and use pond areas primarily for resting rather than feeding. In most years a few birds are present through the summer, but are not known to nest.

WHIMBREL *(N. phaeopus)*: Uncommon to very common in spring (April to mid-May), when it is often found in single species flocks. Virtually all spring records are for the valley west of the Sacramento River. Very rare in fall and winter, when one to a few are occasionally found in flocks of Long-billed Curlews.

SPOTTED SANDPIPER *(Actitis macularia)*: An uncommon spring migrant (mid-March to early June, peak in early May), fall migrant (mid-July to mid-October, peak in August), and winter resident. Uncommon in summer on gravel bars along streams and rivers south at least to Colusa County; found nesting along the Sacramento River in Butte County in 1973 (Gaines 1974). This species also occurs at waste water ponds in migration.

SOLITARY SANDPIPER *(Tringa solitaria)*: A very rare migrant in spring (mid-April to mid-May) and a rare migrant in fall.

GREATER YELLOWLEGS *(T. melanoleuca)*: A fairly common spring migrant (mid-March to mid-May, peak in early April), when many birds move through the foothill regions on both sides of the valley using ponds and streams which are usually dry in fall. A common fall migrant (mid-July to mid-October, peak in early September) and uncommon winter resident, frequenting pond edges, rivers and streams.

LESSER YELLOWLEGS *(T. flavipes)*: A very rare spring migrant (April), an uncommon to fairly common fall migrant (27 June to 12 October, peak in early September) and a rare winter resident. This species appears to be more common in the Sacramento Valley than along the central California coast.

WILLET *(Catoptrophorus semipalmatus)*: A rare spring migrant (April) and a rare to uncommon fall migrant (8 July to 20 September). Casual in winter (see Appendix). Most of the fall records are from July and August which corresponds to the first of two fall peaks noted by Storer (1951) for this species at Bay Farm Island, Alameda County, along the central California coast. If there are two populations present in migration along the coast, then probably only the earlier moves

through the Sacramento Valley. The second peak recorded at Bay Farm Island may represent the coastal wintering population, which is apparently not present, except casually, in the valley.

RED KNOT *(Calidris canutus)*: A casual spring and fall migrant (see Appendix).

DUNLIN *(C. alpina)*: A common to very abundant spring migrant (mid-March to mid-May, peak in late April), a common to abundant fall migrant (October to early December) and a common winter resident.

LEAST SANDPIPER *(C. minutilla)*: A very common spring (mid-March to mid-May, peak in late April) and fall (July to mid-October) migrant, and an uncommon winter resident. A few individuals may be found in most summers. The fall migration periods of this species and the similar Western Sandpiper tend to be temporally separated (Figure 2) as was noted by Recher (1966) for these birds on the coast.

BAIRD'S SANDPIPER *(C. bairdii)*: An uncommon fall migrant (27 June to 10 October, peak in August). Casual in spring (see Appendix). This sandpiper, along with the Pectoral Sandpiper which has a similar continental distribution, is more numerous in the Sacramento Valley than along the central California coast in fall.

SHARP-TAILED SANDPIPER *(C. acuminata)*: There are two fall records from the Woodland sugar ponds. One was observed in close comparison with Pectoral Sandpipers on 6 and 7 September 1971 by R. Stallcup, D. Gaines, R. LeValley, B. Kimball and the authors. The record was not published, but a description is on file with the Middle Pacific Coast Regional Editors of *American Birds*. A second bird was seen 4 to 16 October 1973 (Remsen and Gaines 1974).

PECTORAL SANDPIPER *(C. melanotos)*: An uncommon to fairly common migrant in fall (mid-August to October, peak in late September). There is one spring record (see Appendix). As noted above under Baird's Sandpiper, this species is more common in the valley than along the coast in fall.

WESTERN SANDPIPER *(C. mauri)*: A common to abundant migrant in spring (mid-March to mid-May, peak in late April) and fall (mid-July to October, peak in early September). An uncommon winter resident. Figure 2 compares the fall migration periods of this species and the Least Sandpiper at Chico, Butte County.

SANDERLING *(C. alba)*: A very rare fall migrant. There are two spring records (see Appendix). All of the fall records are from eastern Yolo County with the exception of one photographed at Chico on 2 and 3 September 1973 (Remsen and Gaines 1974).

SHORT-BILLED DOWITCHER *(Limnodromus griseus)*: A rare spring (April to mid-May) and fall (July to mid-September) migrant. This dowitcher is probably more numerous than the few records a year indicate, partially because it is difficult to separate it in the field from the very abundant Long-billed Dowitcher. Many of our observations are of birds observed away from the Long-billed Dowitcher flocks, which may be due to either one of two factors: 1) Short-billed Dowitchers may prefer a different substrate for foraging (Lenna 1969), or 2) when isolated, Short-billed Dowitchers are more easily identified by plumage and, especially, by call. The Short-billed Dowitcher is far more common along the central California coast in migration than in the Sacramento Valley.

LONG-BILLED DOWITCHER *(L. scolopaceus)*: Fairly common to very abundant in spring (mid-March to mid-May, peak in mid-April) and fall (July to mid-October, peak in early September). Common in winter and uncommon in summer. Fall migration inland differs from that along the coast where this species is uncommon until late September, when the wintering population probably arrives (Lenna 1969). Competitive interactions between the two dowitcher species may account for this difference in Long-billed Dowitcher migration periods because the Short-billed Dowitcher is a common coastal migrant.

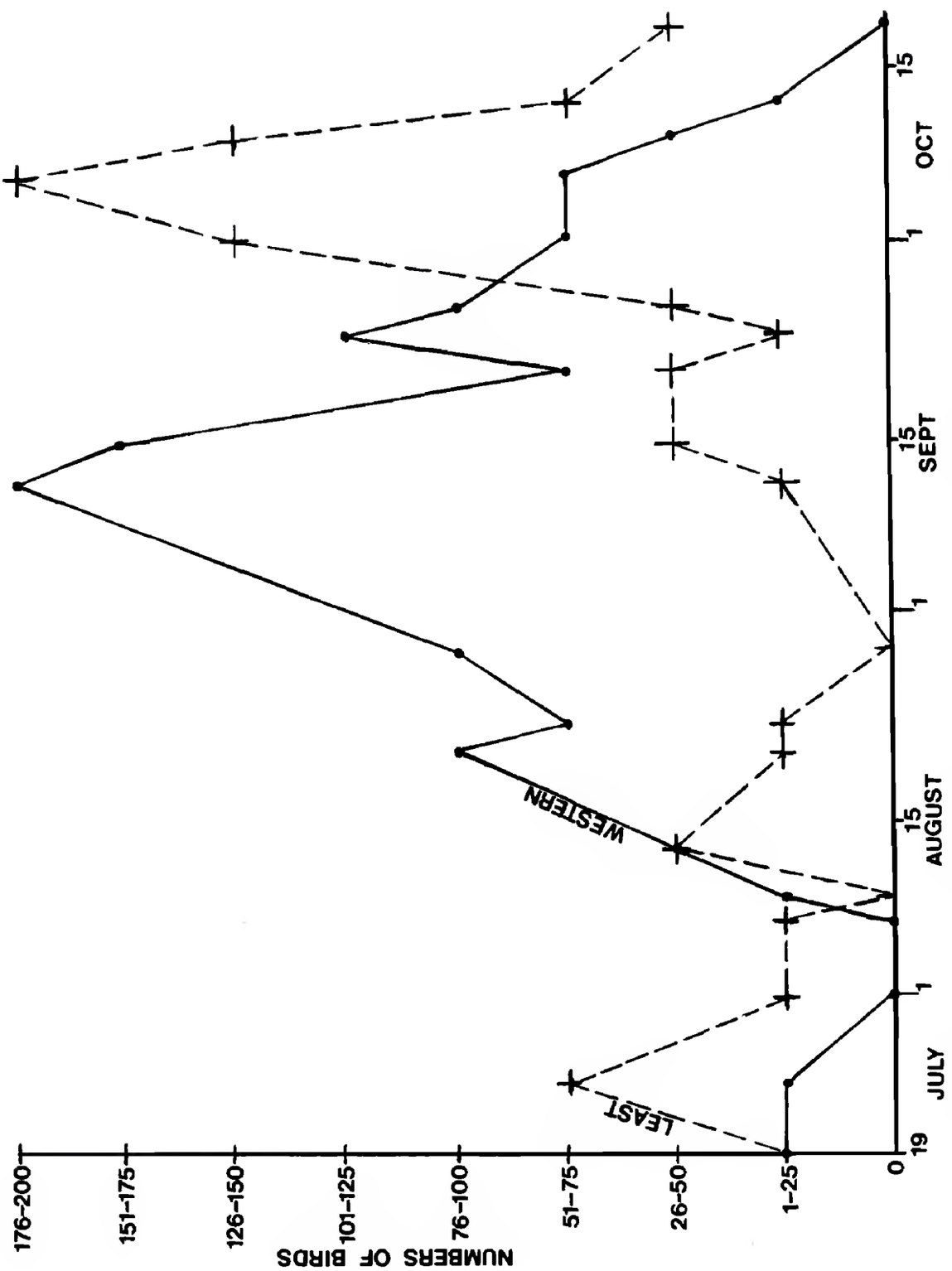

Figure 2. Estimated numbers of Least and Western sandpipers at the Chico sewage ponds, Butte County, in fall 1972.

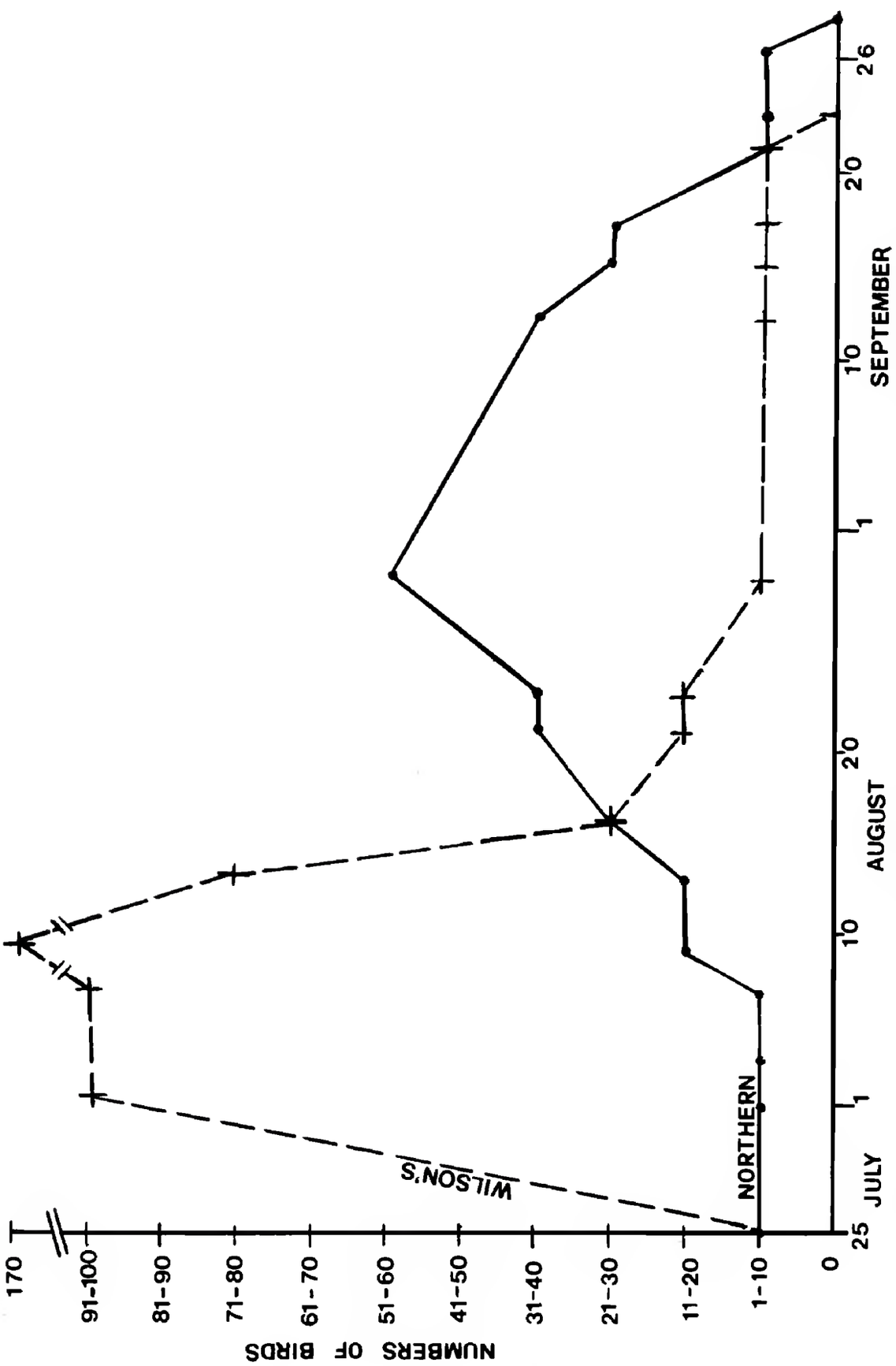

Figure 3. Estimated numbers of Wilson's and Northern phalaropes at the Chico sewage ponds, Butte County, in fall 1972.

STILT SANDPIPER *(Micropalama himantopus)*: Casual in fall (see Appendix). In light of the status of the Baird's and Pectoral sandpipers, which have mid-continental migration routes similar to that of the Stilt Sandpiper, and of the regular occurrence of Stilt Sandpipers at the Salton Sea in southern California (McCaskie 1970), this sandpiper may be regular in the Sacramento Valley, but is possibly overlooked in the large dowitcher flocks with which it frequently associates.

MARBLED GODWIT *(Limosa fedoa)*: A rare spring migrant (April) and an uncommon fall (mid-July to September) migrant. Casual in winter (see Appendix). The relative scarcity of this species in the Sacramento Valley parallels that of the Willet; the Marbled Godwit also is a freshwater breeding bird of the northern Great Plains and in winter is one of the more common shorebirds of the central California coast.

AMERICAN AVOCET *(Recurvirostra americana)*: A very common summer resident and breeder. Rare in winter. The exact duration of the spring migration is unclear as it overlaps the breeding season. From census data for Woodland (Jurek 1971), it appears that spring migration begins in early February and reaches a peak in mid-April. Fall movements are also not well defined, but apparently consist of a gradual reduction of post-breeding numbers until mid-August, followed by a leveling off to a final drop in early November.

BLACK-NECKED STILT *(Himantopus mexicanus)*: A common summer resident and breeder. Casual in winter (see Appendix). Apparently, spring movements begin in early March and peak in mid-April. Fall numbers begin to increase in late August, peak in mid-September, and then decline almost to zero by early October (Jurek 1971).

RED PHALAROPE *(Phalaropus fulicarius)*: A very rare fall migrant. There is one spring record (see Appendix).

WILSON'S PHALAROPE *(Steganopus tricolor)*: An uncommon spring (late April to mid-May) migrant and a very common fall (July to mid-October) migrant. Rare in summer, but there are no breeding records. Figure 3 compares fall migration patterns of this phalarope and the Northern Phalarope at Chico in 1972.

NORTHERN PHALAROPE *(Lobipes lobatus)*: An uncommon spring (late April to mid-May) migrant and a common to abundant fall (mid-July to mid-October, peak in late August) migrant. There are two winter records (see Appendix). There appears to be temporal segregation of peak fall movements of this species and Wilson's Phalarope (Figure 3).

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APPENDIX

The following records are of shorebird species of casual occurrence in the Sacramento Valley in certain seasons. They cover the period prior to 1975, and are in chronological order for each species. WP indicates the Woodland sugar ponds and vicinity and DP indicates the Davis sewage ponds. Both are in Yolo County. SCBC indicates the Sacramento Christmas Bird Count; the count area includes parts of both Sacramento and Yolo counties. *American Birds* is abbreviated by AB and *Audubon Field Notes* by AFN.

SNOWY PLOVER: 1, DP 29 Jul 1962 (AFN 16:504, 1962); 1, WP 8 Sep 1968 (AFN 23:102, 1969).

AMERICAN GOLDEN PLOVER: 1, five miles south of Sacramento, Sacramento Co. 15 Feb 1959 (AFN 13:318, 1959); 1, WP 9 Dec 1961 (AFN 16:361, 1962).

RUDDY TURNSTONE: 1, WP 2 Oct 1960 (R. Stallcup pers. comm.); 1, DP 28 Jul 1963 (AFN 18:69, 1964); 1, DP 12-14 Aug 1970 (AFN 24:713, 1970); 1, DP 28 Aug 1971 (Lovelesses pers. comm.); 2, DP 15-19 Aug 1972 (AB 26:901, 1972); 1, Chico, Butte Co. 18 Aug 1973 (AB 28:99, 1974).

WILLET: 2, SCBC 27 Dec 1953 (AFN 8:221, 1954); 12, SCBC 27 Dec 1958 (AFN 13:253, 1959); 1, SCBC 30 Dec 1961 (AFN 16:288, 1962); 1, Oroville, Butte Co. 1 Jan 1973 (AB 27:520, 1973).

RED KNOT (spring records): 4, along Highway 12 between Rio Vista and Fairfield, Solano Co. 24 Apr 1965 (AFN 19:508, 1965); 1, WP 9 May 1971 and 22, WP 15 May 1971 (AB 25:795, 1971). (fall records): 3, DP 19 Aug 1962 (AFN 17:64, 1963); 1, Thermalito Afterbay, Butte Co. 22 Aug 1968 (AFN 23: 102, 1969); 2, DP 8 Aug 1971 (AB 25:902, 1971).

PECTORAL SANDPIPER: 1, WP 12 May 1962 (AFN 16:444, 1962).

BAIRD'S SANDPIPER: 3, Dales, Tehama Co. 14 Apr 1928 (Grinnell et al. 1930); 1, Folsom Lake, Sacramento Co. 21 Apr 1961 (AFN 16:444,1962); 1, WP 25 Apr 1970 (B. Kimball pers. comm.).

SANDERLING: 5, DP 14 May 1960 (AFN 14:418, 1960); 3, DP 2 May 1971 (AB 25:795, 1971).

STILT SANDPIPER: 2, WP 1 Oct 1960 (AFN 15:72, 1961); 1, WP 19 Sep 1965 (AFN 20:88, 1966); 1, WP 6-7 Sep 1971 (AB 26:114, 1972); 2, Yolo Bypass, Yolo Co. 12 Oct 1973 (AB 28:101, 1974).

MARBLED GODWIT: 3, SCBC 27 Dec 1953 (AFN 8:221, 1954); 2, SCBC 30 Dec 1956 (AFN 11:230, 1957); 9, SCBC 29 Dec 1957 (AFN 12:240, 1958); 1, SCBC 27 Dec 1958 (AFN 13:253, 1959); 5, Chico, Butte Co. 31 Dec 1972 (AB 27:505, 1973).

BLACK-NECKED STILT: 1, Yolo Bypass, Yolo Co. 28 Nov 1954 (AFN 9:282, 1955); 5, SCBC 26 Dec 1971 (AB 26:520, 1972).

RED PHALAROPE: 1, WP 28 Apr 1974 (AB 28:847, 1974).

NORTHERN PHALAROPE: 1, Sacramento National Wildlife Refuge, Glenn Co. 23 Feb 1959 (AFN 13:318, 1959); 1, SCBC 30 Dec 1961 (AFN 16:288, 1962).

Sketch by Tim Manolis

STATUS OF THE HARLAN'S HAWK IN WASHINGTON, AND NOTES ON ITS IDENTIFICATION IN THE FIELD

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The "Harlan's Hawk" (*Buteo jamaicensis harlani*) was first reported in Washington in 1968. Since then it has been recorded in the state with increasing regularity, and in increasing numbers. The records fall between 26 September and 28 March, and come mainly from three areas: the region surrounding Spokane in eastern Washington, and small areas of western Skagit and Whatcom counties in western Washington.

I believe that the recent increase in records in Washington is not simply a reflection of better trained and equipped observers turning up a bird which was always present, but rather indicates that *harlani* is currently establishing itself as a regular winter visitor.

IDENTIFICATION IN THE FIELD

It is first necessary to say something about the identification of *harlani* in the field, since this is a subject of much, perhaps unnecessary, mystification. I am writing this section not only because I hope it will be of help to others, but also to show how I am able to individualize birds confidently in the field for purposes of ascertaining the number of birds under observation each winter. My discussion covers only dark-phased birds; I have never seen the light phase, and so cannot comment on it.

As with all birds which require careful identification, it is well to see several characters together, rather than to rely on any one by itself. In this regard, I have found a paper by Wood (1932) particularly helpful. He compared a large series (137) of *harlani* with a series of the dark-phased Western Red-tailed Hawk (*B. j. calurus*), the bird he considered most likely to be confused with Harlan's Hawk.

One point of constant difference he found is a liberal spotting of white on the back of *harlani*, and also on the underparts, "often from bill to feet." This is opposed to an absence of white on the body of the dark-phased *calurus* except at the base of the feathers of the head and neck. I have found this white spotting, which is inadequately represented in the field guides (Peterson 1947, 1961; Robbins et al. 1966), to be a regular and helpful character for recognizing even sitting birds, when no other field mark is visible. I have also found it useful for distinguishing between individual birds in the field, since the spotting on the underparts occurs in a number of unique patterns. There are two basic patterns: (1) a dark ground color thickly spotted with small white dots (see Wood, op. cit., Figure 22) and (2) large white spots with the black

ground color reduced to a reticulation about them.

The two basic patterns grade into each other in a continuous series. In the extremes I have seen, either the entire breast and belly are dark, with only a few white flecks on the upper breast, or the black reticulation is so reduced that it fragments, producing an effect of a white ground color with black streaking (Wood, Figure 20). These two extremes seem to correspond to the "Melanistic" and the "Intermediate" phases of Friedmann (1950), although both are very dark birds generally. In patterns between these extremes, there is frequently a tendency for the dark coloring to predominate on the belly, the light on the breast, creating the effect of a dark "belt" below a lighter breast. I have also seen an individual with a thin band of white spotting at the junction of the dark upper breast and lower belly.

Although Wood does not mention this, birds I have seen have frequently had large patches of white on the head as well. For example, I have seen two individuals with large white "goggles" around the eyes.

Another good recognition character (inaccurately represented by Peterson, and inadequately by Robbins et al., but shown very well in Wood, Figure 22) is the underwing marking, by which I have recognized *harlani* soaring high above me. The constant feature is that the entire wing lining is dark, *heavily spotted with white.* Both Robbins et al. and Peterson also show *calurus* and the dark phase of the Rough-legged Hawk (*B. lagopus*) with entirely dark wing linings. In this I believe they are inaccurate. Even very dark phased *calurus*, in my experience, tend to have buffy wing linings with the typical Red-tail's capital "C" at the carpal. Similarly, I have seen Rough-legged Hawks that were entirely black, not even showing white at the base of the tail, which nonetheless retained a typical essentially white underwing with a strong black carpal patch. But even if some individuals of these forms are marked as the field guides show them, the distinguishing character of *harlani* is the white spotting within the black.

The tail, of course, is the best character for identification of *harlani*. Further, its variability in color and marking, in combination with the pattern of the underparts, is useful for recognizing individual birds. Most frequently I have observed a white tail streaked and mottled with black, the mottling more or less coalescing into a ragged subterminal, or sometimes terminal, black band (well illustrated in the two pictures of flying *harlani* in Robbins et al. 1966:73). But occasionally the tail is more or less suffused with pale rusty (the "cinnamomeous" of Friedmann, op. cit.). One bird I saw several times had this color just on the outer one or two rectrices of an otherwise typical tail, which helped me to identify this particular individual at a glance, even from a distance, when it flew away from me. Another had the base of its tail white with the rusty color starting about mid-tail and becoming grad-

ually darker to the tip. Despite this odd tail (Friedmann describes one like it), I am certain of the identification, because the bird also had abundant white spotting on its back, breast, and belly, and had dark but white-spotted wing linings (this is the advantage of having several characters on which to rely).

Providing additional confirmation on the last mentioned individual were the naked, bright yellow tarsi. Seeing the yellow tarsi (except on very typical *harlani*) is a necessary check to avoid confusion with dark-phased Rough-legged or Ferruginous hawks (*B. regalis*).

The tail of the immature *harlani*, according to Wood, has the barring in oblique angles and zigzag lines, rather than straight as in *calurus* (see his Figure 23). In my experience this character cannot be seen in the field. However, the white spotting on the body and the markings of the underwing will identify even the immature bird.

WASHINGTON RECORDS

The state's first record for *harlani* was in 1968 in the Spokane area (see Appendix for all records). In 1970 a probable *harlani* was again seen near Spokane, but not well enough to be certain of the identification. In this same area two were observed in the winter of 1971-72, and one in the winter of 1973-74. All of these were seen, either originally or confirming others' sightings, by James F. Acton and (usually) Warren A. Hall.

In the 1971-72 winter season the first Harlan's Hawk was recorded in western Washington, a light-phased bird seen by James Duemmel near Bellingham, Whatcom County. During the same period I saw a dark-phased *harlani* in western Skagit County 30 km south of Bellingham. In the winter of 1972-73 I saw two more in the same area of Skagit County, one of these repeatedly; and judging by the differing descriptions (Eugene Hunn pers. comm.) an additional two were seen in roughly the same area by Laurence C. Binford and Hunn. In the 1973-74 winter season I saw six individuals in the same area of Skagit County, and two more in the Bellingham vicinity. Some of these I saw repeatedly. Other birders I sent to a favored location also saw *harlani*, but I do not know if these were the same or different birds, and so I do not include them in this account.

In all, at the time of this writing (1974), *harlani* has been reported four times in the Spokane area and three times in the Bellingham area. The remaining eleven Washington sightings are from an area only 5 or 6 km in diameter between the towns of Bayview and Allen, western Skagit County. I have made the majority of my sightings along Benson Road, finding the birds in an area no more than 100 x 200 m in extent where the edge of a steep wooded ridge borders an extensive area of flat open agricultural land.

PRESENT STATUS IN WASHINGTON

For three reasons, I believe that *harlani* is in the process of establishing itself as a regular winter visitor to the state: (1) the steadily increasing number of records each winter; (2) its occurrence each year, not at random throughout the state, but regularly in three specific areas; (3) a discernible pattern to its invasion.

INCREASED SIGHTINGS

A sudden increase in sightings of a bird, particularly a difficult-to-identify raptor, does not necessarily indicate that the bird in question has actually undergone a change in status. Two factors may have operated instead. First, larger numbers of better trained and equipped birders are in the field now than there were even a few years ago, so that even a declining species might be recorded more frequently now than formerly. Secondly, it is possible for a species to be regularly present but undetected in an area. When it is at last seen, other birders learn the field marks and make a special effort to look for it, turning up a rash of sightings which give the illusion of a sudden invasion. I believe I can demonstrate that in the case of *harlani* in Washington, neither of these factors is operating, and that the increasing reports of this bird indicate an actual change in status.

Acton (pers. comm.) has been actively birding the Spokane area since 1960. He did not see *harlani* until 1968, and since then has made three other positive and two probable sightings. Duemmel (pers. comm.) has been actively birding on the Lummi flats area west of Bellingham since 1966, but did not see his first *harlani* until 1971. In each case the bird was first seen by an experienced observer on his home territory and was instantly recognized as unlike any bird seen previously in the area. These obviously are not, then, cases of an increase in observers, equipment or expertise.

My own case is different. I first moved to western Skagit County in September 1970, but did not explore the area very carefully in the winter of 1970-71. In subsequent years I have covered it fairly consistently, turning up one *harlani* in 1971-72, two in 1972-73, and six in 1973-74. In each year I looked for them in the same place. Although in 1973-74 I spent, if anything, less time than in the previous two years searching for *harlani*, I found them almost every time I looked. So I am satisfied that the increased number of my sightings was not a question of my knowing better where to look, but rather was due to an actual increase.

REGULAR OCCURRENCE

My next point is that *harlani*, being recorded regularly in only three small areas of the state, is establishing regular wintering areas. If it were

merely casual in the state, it could turn up anywhere. Its extreme localization, especially in western Skagit County, on the other hand, suggests that it is resorting habitually to a traditional area.

It can, of course, be argued that if a bird is always sought in the same place, it will only be found in that place, thereby biasing the number of observations there. Indeed Acton (pers. comm.) feels there is too much suitable habitat and too few observers around the Spokane area to allow speculation on whether or not the bird is localized there. The case is different in my own area. The entire Skagit and Samish River flats of western Skagit County make up, in winter, one of the best raptor areas in the state, being particularly rich in falcons (*Falco* spp.). The small area where I have found *harlani* regularly is in the center of this larger area and (apart from *harlani*) is rather less productive than the rest of the flatland. It is fair to say that I explore the rest of the flatland in the county much more regularly than I do the "Harlan's Hawk" area, and yet I have never encountered *harlani* anywhere outside their area. Within their area, which they share in winter with Western Red-tailed and Rough-legged hawks, in 1973-74 I encountered *harlani* more frequently than either of the other forms.

Two of the three sightings of *harlani* in the Bellingham area were made by myself on the same day, at a time in the spring when my experience told me *harlani* would begin disappearing from the Skagit flats area. Since Duemmel (pers. comm.), canvassing the Bellingham area thoroughly during that winter, had not seen any *harlani*, I suspect the two I saw were birds moving north from my area.

INVASION PATTERN

According to the AOU Check-list (1957) *harlani* nests in a relatively small area of southeast Alaska, southwest Yukon, northeast British Columbia, extending southeastward into Alberta. The migration route is southeastward to wintering grounds in another relatively small area of south-central United States.

Since 1962 there have been a number of records of *harlani* in and around Washington which are all well to the southwest of the traditional migration route. These records follow a pattern which lends further support to my suggestion that *harlani* is exploring and establishing new wintering grounds. The pattern (Figure 1) begins with a wide and random scattering of fall occurrences (southeastern British Columbia; Bozeman, Montana; Spokane, Washington; northeastern Oregon), suggesting migratory exploration. This is followed by winter records (at Bozeman and Spokane), suggesting birds beginning to overwinter. At the same time birds begin to appear west of the Cascade Range (near Vancouver, B.C., near Portland, Oregon, and in northwestern Washington). Finally, the records increase in numbers and regularity, and be-

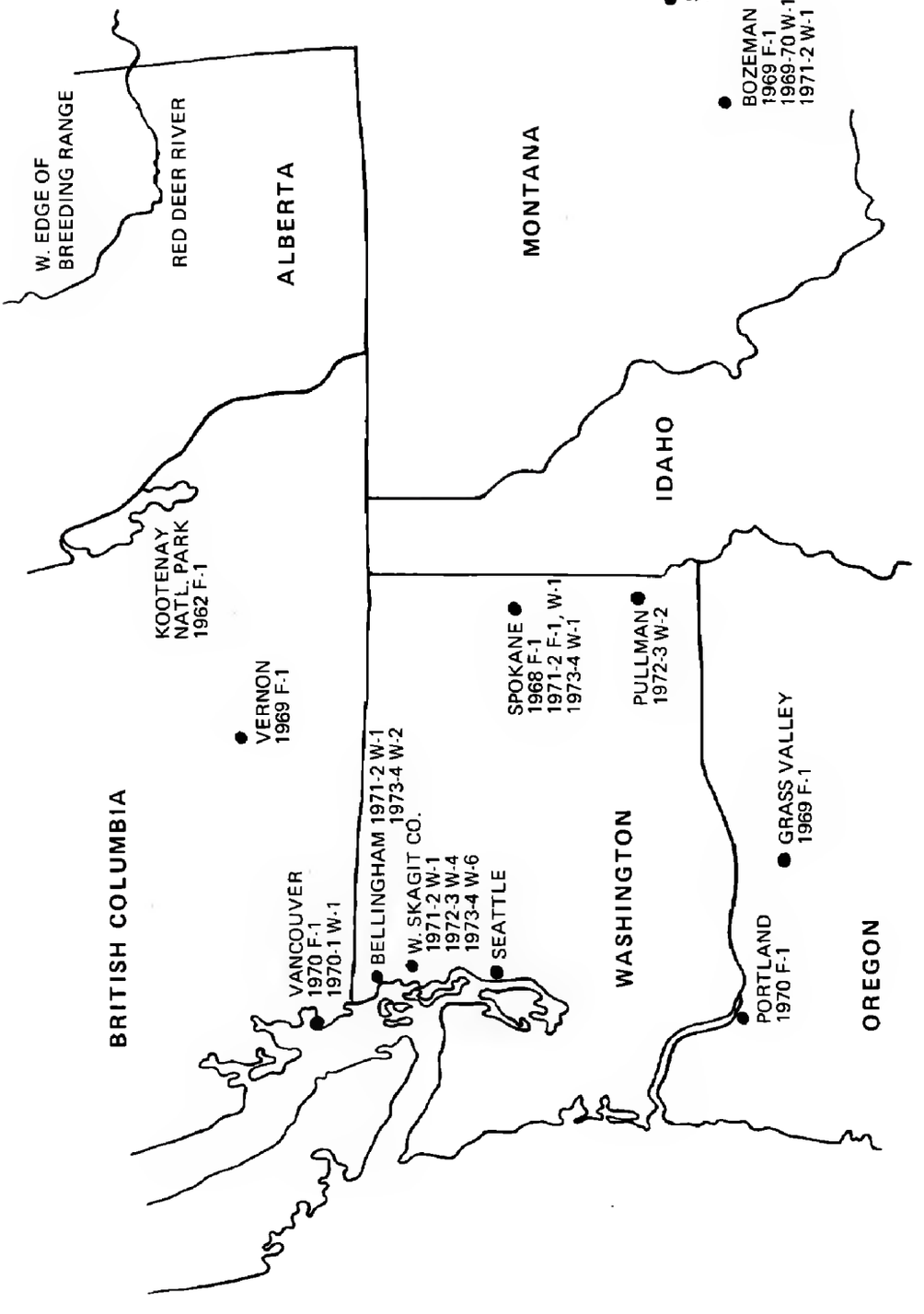

Figure 1. Records of Harlan's Hawk (*Buteo jamaicensis harlani*) in the Pacific Northwest which have occurred southwest of the AOU Check-list (1957) range. Year, season, and number of individuals present are shown for each locality. F indicates fall records (September through 15 November) and W indicates probable overwintering birds (16 November through 28 March).

come localized (around Bozeman, around Spokane, and in western Skagit and Whatcom counties) as the new wintering grounds are established.

SUMMARY

Some field marks helpful for identification of the darker phases of "Harlan's Hawk" are discussed, and suggestions are given for distinguishing particular individuals in the field. All known records for the occurrence of *harlani* in and immediately around the state of Washington are given. It is noted that these occurrences have increased dramatically in the past few years and have become increasingly localized, especially around one very small area of western Skagit County in western Washington. It is argued that this species, unrecorded in the state before 1968, has now become established as a regular winter visitor to western Skagit County and possibly to the Spokane region.

ACKNOWLEDGMENTS

I wish to thank James F. Acton for generously supplying me with his records for northeastern Washington, Bruce Webb, Laurence C. Binford, and Tim Manolis for reading earlier versions of the manuscript and making numerous suggestions, and Anthony Galván III for attractively illustrating my paper.

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APPENDIX

Extralimital records for Harlan's Hawk in the Pacific Northwest are arranged chronologically by winter season. Records with no reference following them are of my own observations. *Audubon Field Notes* and *American Birds* are abbreviated AFN and AB, respectively.

1962-63—1, Kootenay Natl. Park, SE B.C., 18 Oct 1962 (Rogers, AFN 17:51, 1963).

1964-65—1, N of Bozeman, Mont. (1st state record), 25 Oct 1964 (Rogers, AFN 19:61, 1965).

1968-69—1, W of Spokane, Wash. (1st state record), 26 Sep 1968 (Acton pers. comm.).

1969-70—1, S of Vernon, B.C., 4 Sep 1969; 1, near Grass Valley, Sherman Co., Ore. (1st state record?), 13 Nov 1969; 1, near Bozeman, 22 Dec 1969 (Rogers, AFN 24:71, 522, 1970).

1970-71—1, Sauvie's Island, near Portland, Ore., 14 Aug 1970; 1, Ladner, near Vancouver, B.C., 21 Nov 1970; 1 (possible falconer's escape—Wayne Weber pers. comm.), Pitt Meadows, near Vancouver, B.C., 13-19 Feb 1971 (Crowell & Nehls, AB 25:96, 616, 1971).

1971-72—1, W of Spokane, 10-11 Oct 1971 (Acton pers. comm.); 1, W of Bozeman, 24 Dec 1971-26 Feb 1972 (Rogers, AB 26:631, 1972); 1, S of Spokane, 30 Jan 1972 (Acton pers. comm.); 1, Lummi flats, near Bellingham, Wash., 30 Dec 1971-22 Jan 1972 (Crowell & Nehls, AB 26:645, 1972); 1, western Skagit Co., Wash., 10 Mar 1972.

1972-73—1, western Skagit Co., 21 Dec 1972-28 Mar 1973 (erronesouly reported, in Crowell & Nehls, AB 27:653, 1973, for the Lummi flats); 2, western Skagit Co., 30 Dec 1972 (Hunn pers. comm.); 1, Sweetgrass Co., Mont., 10 Jan 1973 (Rogers, AB 27:640, 1973); 1, western Skagit Co., 3 Mar 1973; 2, N of Pullman, Wash., 22 Mar 1973 (Rogers, AB 27:640, 1973).

1973-74—1, S of Spokane, 24 Nov 1973-30 Dec 1974 (Acton pers. comm.); 1, western Skagit Co., 25 Nov 1973; 1, western Skagit Co., 2 Jan 1974; 1, western Skagit Co., 9 Feb 1974; 1, western Skagit Co., 23 Feb-16 Mar 1974; 1, Lummi flats, 14-21 Mar 1974; 1, Bellingham, 14 Mar 1974; 2, western Skagit Co., 23 Mar 1974.

Sketch by A. Galván III

NOTES

A FURTHER RECORD OF THE WESTERN WHIP-POOR-WILL IN CALIFORNIA

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On 26 September 1973 I flushed a bird from an ornamental shrub in the courtyard of the apartment complex where I live in the Belmont Shore area of Long Beach, California. Originally thinking it to be a Poor-will (*Phalaenoptilus nuttallii*), a regular migrant in coastal southern California, I flushed the bird several times in attempts to get a better look at it. The correct identity of the bird as a Whip-poor-will (*Caprimulgus vociferus*) was only apparent when it crashed into a window after flying through the open door of an apartment. It was preserved as a study skin now housed in the collections of California State University, Long Beach (CSULB 4433) and proved to be a female with unenlarged ovary, light fat on the abdomen and lower back, weighing 44 g and having some light molt on the chin region. I was able to confirm the species identification by comparison with specimens at the Natural History Museum of Los Angeles County. Subspecific identification was made at the National Museum of Natural History by Dr. Richard C. Banks who determined it to be a representative of the Western Whip-poor-will (*C. v. arizonae*). In addition to being much browner on the back than the Eastern Whip-poor-will (*C. v. vociferus*) (Banks in litt.) it has the brown bases to the otherwise black rictal bristles noted by Craig (1971) as typical of *arizonae*.

The Whip-poor-will is at present an uncommon bird of extremely local occurrence in California. A small population of *C. v. arizonae* appears to be present in the vicinity of Lake Fulmor, Riverside County (Jones 1971), a few individuals having been seen or heard annually since it was first discovered there in 1968 (Johnson and Garrett 1974). More recently the species has been heard calling in summer on Clark Mountain in eastern San Bernardino County (Johnson and Garrett 1974) and the Laguna Mountains, San Diego County (McCaskie 1971). It is thought to breed in both of these localities. In 1971 a Whip-poor-will wintered in southern California and was observed "roosting in shrubbery of a residential yard of Coronado, San Diego County from at least late December to March 25" (McCaskie 1972:655).

A single migrant male attributed to *C. v. vociferus* was captured and banded at Point Loma, San Diego on 14 November 1970 (Craig 1971). Although this bird was compared with museum material before it was released, it should be pointed out that recently Hubbard and Crossin (1974) felt that "in view of the overlap in characters between the two races, we have considerable reservation about the California record of *C. v. vociferus* reported by Craig (1971); the bird was banded and released. Even with the direct comparison to specimens that was done, one cannot rule out the possibility that the bird was not a variant of *arizonae*." If overlap of characters precludes positive subspecific identification of the San Diego bird, then the same should apply to the Long Beach specimen, and Jones' (1971) identification by spectrographic analysis of the tape-recorded song may be the most valid of the California records at the subspecific level.

The Long Beach bird represents the first preserved specimen of this species taken in California. It is in agreement with the reported occurrence at Lake Fulmor of *C. v. arizonae*. As noted by Jones (1971) and Johnson and Garrett (1974) the Whip-poor-will is apparently extending its range northward and westward, and further evidence of its breeding in southern California should be sought. It would not be correct to even speculate as to the populational origin of the Long Beach specimen. However, it should be noted that strong easterly winds were blowing on the date of its capture, presumably having started during the night, and may well have influenced its occurrence at that coastal locality.

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LECONTE'S SPARROW IN CALIFORNIA AND THE WESTERN UNITED STATES

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The LeConte's Sparrow *(Ammospiza leconteii)* nests throughout most of the central portions of southern Canada into the north central United States (Godfrey 1966). In the fall the species moves southward to winter in the southeastern United States (American Ornithologists' Union 1957). Records from the western United States are few indeed, thus all occurrences there are worthy of note.

On 27 October 1974 a party including Richard Stallcup, Jon Dunn, Philip Unitt, the author and others discovered a LeConte's Sparrow in tall grass growing in a wet area of the golf course at Furnace Creek Ranch, Death Valley National Monument, California. The following day two LeConte's Sparrows were together in the same area, and one of these remained to 1 November. Since suitable habitat was restricted, it was easy to study these birds and be assured that the identifications were correct.

The two birds appeared identical, being small and short tailed. Much of the face and breast was a rich orange-buff, and a broad whitish stripe extended from the forehead back over the crown to the nape. The back and wings appeared fairly dark, being a mixture of rich dark browns and rust, but pale buff edgings were present on some of the feathers forming conspicuous stripes down the back. Many migrants were taking advantage of this desert oasis at this time (a total of 86 species of birds seen 26-28 October), including a variety of sparrows. At one time on the 27th it was possible to compare a LeConte's Sparrow directly with a Savannah Sparrow *(Passerculus sandwichensis)*, a Chipping Sparrow *(Spizella passerina)*, a Clay-colored Sparrow *(S. pallida)*, a Lincoln's Sparrow *(Melospiza lincolnii)* and a Swamp Sparrow *(M. georgiana)*, while a Grasshopper Sparrow *(Ammodramus savannarum)* was nearby. By 1 November at least eight other experienced observers had seen these LeConte's Sparrows, and all agreed on the identification.

This is the third time the LeConte's Sparrow has been found in California, although there have been cases of Grasshopper Sparrows being reported as *leconteii*. The first LeConte's Sparrow was an immature male collected by T. J. Lewis on Southeast Farallon Island on 13 October 1970 (Chandik et al. 1971). The specimen (California Academy of Sciences No. 68505) possessed a trace of fat, testes measuring 1 x 1 mm and a skull about one-half ossified; the fresh carcass weighed 10.7 g and was not in molt except for the regrowth of some feathers on the right side of the crown. The second *leconteii* was one photographed at Point Pinos in Pacific Grove, Monterey County, on 19 October 1974 (Stallcup et al. 1975).

The LeConte's Sparrow normally stays well to the east of the Rocky Mountains. It has been recorded twice in Colorado on the west side of the Rockies (Bailey and Niedrach 1965): a specimen, no longer extant, collected at Breckenridge, Summit County, on 24 October 1886 and a specimen from near Gunnison, Gunnison County, on 6 May 1952. In extreme eastern New Mexico it has been found wintering irregularly in the vicinity of Roswell, Chaves County, and one was seen at San Ildefonso, Santa Fe County, on 24 November 1963 (Hubbard 1970). Four sightings are reported from Big Bend National Park and vicinity in extreme west Texas (Wauer 1973): two on 10 March 1963, one on 29 August 1966, two on 29 October 1966 and one on 3 January 1972. However, extreme dates listed for Texas are 4 October and 20 May (Oberholser and Kincaid 1974), strongly suggesting the August sighting to be in error.

Farther to the west a bird was collected at Coeur d'Alene, Kootenai County, Idaho, on 28 September 1896 (Burleigh 1972). One was taken near Provo, Utah County, Utah, on 24 December 1927 (Cottam 1941), three more were seen near Provo on 10 March 1928 (Woodbury et al. 1949) and another was reported seen at Moab Slough, Grand County, Utah, on 19 April 1966 (Scott 1966). One hit a window in Kennewick, Benton County, Washington, on 29 May 1964 (LaFave 1965).

It is clear there are but a limited number of records for LeConte's Sparrows in the western United States; however, this is a secretive species that skulks in the grasses and can easily be overlooked. The first record of *leconteii* for New Mexico involved 20 to 30 individuals (Montgomery 1953), suggesting a normal wintering population. Observers should therefore be on the alert for this species in the fall and winter, but must treat all sightings with caution since similarity to the Grasshopper Sparrow has resulted in misidentifications.

I wish to thank Dr. Laurence C. Binford for supplying the information on the California specimen of *leconteii*, and Terence R. Wahl for guiding me to the reference for the Washington record.

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A SIGHT RECORD OF THE PAINTED REDSTART NEAR VANCOUVER, BRITISH COLUMBIA

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On 4 November 1973 a Painted Redstart (*Setophaga picta*) was discovered at about 0900 by Brian Kautesk in Ambleside Park, West Vancouver, just north of Vancouver, British Columbia. During the course of the day, the bird was also seen by Wayne C. Weber and a number of other local observers including Kelly E. Allies, Wilson F. Allies, Bruce A. Macdonald, Roy W. Phillips, G. Allen Poynter, Helen Poynter, Edward C. Sing, and Wendy J. Weber. At least three of the observers (Allen Poynter and the authors) made detailed notes on the bird in the field, upon which the description below is based, but no photographs could be obtained. Although the area was searched intensively by birders during the next week, the redstart could not be found on subsequent dates.

The bird was mainly black, with large white patches in the wings. The tail showed very conspicuous white sides. The lower breast was a deep rose-pink, and the abdomen and undertail coverts were white. The bill was slender, black, and sharp-pointed. A white spot below the eye was noticeable. The size was estimated as less than 15 cm long, but larger than a chickadee. The redstart's behavior seemed typical for the species; it repeatedly fanned the tail and moved about with half-open wings, hopping usually along branches rather than sideways from branch to branch. The bird was associated with a small flock of Black-capped and Chestnut-backed chickadees (*Parus atricapillus* and *P. rufescens*), Golden-crowned Kinglets (*Regulus satrapa*), and Dark-eyed Juncos (*Junco hyemalis*) which were moving through a small patch of mixed forest consisting largely of Western Hemlock (*Tsuga heterophylla*), Western Red Cedar (*Thuja plicata*), Red Alder (*Alnus rubra*), and Broadleaf Maple (*Acer macrophyllum*). It foraged mainly in the lower branches, and was seen as close as 5 to 6 m with 7x and 10x binoculars. At least one of the observers (Wayne C. Weber) has had previous field experience with the species in Arizona.

Copies of the original field descriptions are on file at the British Columbia Provincial Museum in Victoria. Mr. R. Wayne Campbell, Assistant Curator of Birds and Mammals at the museum, who is currently updating the checklist of British Columbia birds, tells us that he considers the evidence acceptable for the inclusion of the Painted Redstart on the provincial list.

This is the first record of the Painted Redstart in British Columbia, and the second in Canada. The appearance of the species in late fall near Vancouver is difficult to explain, particularly since there appear to be no records for Washington or Oregon. The normal range is from Arizona, New Mexico, and western Texas south to Nicaragua (American Ornithologists' Union, Check-list of North American birds, 1957). There are numerous recent records from southern California, including a nesting record (Unitt, Western Birds 5:94-96, 1974), and there are also a number of extralimital records of the species in eastern North America. The only previous Painted Redstart record for Canada was a bird at Pickering, Ontario (Speirs and Pegg, Auk 89:898, 1972) which was first seen, by coincidence, exactly two years before the Vancouver bird (on 4 November 1971) and was later captured and photographed. Speirs and Pegg also mention three records in the northeastern United States, from Marblehead Neck, Massachusetts; Madison, Wisconsin; and near Cleveland, Ohio. It seems worth noting that, of these four northeastern sightings, three were in October and November.

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Endangered Species Act

Endangered and Threatened Species; Establishment of a Nonessential Experimental Population for the Black-Footed Ferret in Wyoming

Agency: Fish and Wildlife Service, Interior.

Action: Final rule.

Summary: The U.S. Fish and Wildlife Service (Service) is establishing a nonessential experimental population of the black-footed ferret (*Mustela nigripes*) in Wyoming under section 10(j) of the Endangered Species Act of 1973, as amended (Act). The Service has determined that the establishment of this population will further the conservation of the species. The black-footed ferret was extirpated from Wyoming by the mid-1970's. The nonessential experimental population will be released in Shirley Basin, Carbon County, Wyoming, and will be managed according to the provisions of a Memorandum of Agreement and Conservation Plan signed by the Service, Wyoming Game and Fish Department, Bureau of Land Management, and the Wyoming Governor's Office. The Service has determined that the nonessential experimental population is not essential to the continued existence of the species in the wild. Black-footed ferrets released into the nonessential experimental population will be treated as threatened species for the purposes of section 7 of the Act. All other provisions of section 7 and all provisions of section 9 of the Act will not apply to the nonessential experimental population.

Dates: This rule is effective on October 1, 2001.

Addresses: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Wyoming Ecological Services Office, 4000 Airport Parkway, Cheyenne, Wyoming 82001. Requests for copies of the regulations regarding this population should be addressed to the Black-Footed Ferret Recovery Coordinator, Mountain-Prairie Region (6), U.S. Fish and Wildlife Service, 134 Union Blvd., Lakewood, Colorado 80228.

For further information contact: Pete Gober, Black-Footed Ferret Recovery Coordinator, at the above address, telephone 303/236-7905, extension 268.

Supplementary Information:

Background

The black-footed ferret is one of the most endangered mammals in North America. Historically, it occurred in 11 States and 3 Canadian provinces. Its decline was probably caused by a combination of factors, including habitat loss and disease. The last known wild population was discovered in Wyoming in 1964. By the mid-1970's, the species was extirpated from Wyoming and the rest of its range. In 1981, a small population was discovered near Meeteetse, Wyoming. Intensive efforts were undertaken to capture and breed the animals in captivity. Reintroductions began in 1991. Currently, there are 18 reintroduced populations in 8 States and Canada. Most of these populations are small and are not considered self-sustaining. The Service has listed the black-footed ferret as endangered since 1967.

Section 10(j) of the Act allows the Service to designate a population of a listed species as experimental if it is wholly separate geographically from nonexperimental populations of the same species. The Service must find that the experimental population is not essential to the continued existence of the species in the wild. Each designated experimental population is treated as either threatened or endangered, depending on the species' status. Regulations governing the experimental population must be as necessary and advisable to conserve the species. The Service has the discretion to include provisions that are more or less restrictive than those provided for threatened species.

Under section 7 of the Act, Federal agencies must consult with the Service to ensure that their actions are not likely to jeopardize the continued existence of endangered species or threatened species. Consultation is not required for experimental populations that are designated as nonessential. Private landowners are not affected by the designation of critical habitat for endangered species. Critical habitat is not designated for nonessential experimental populations.

Discussion

The Service has determined that the establishment of a nonessential experimental population of black-footed ferrets in Wyoming will further the conservation of the species. The Service has also determined that the nonessential experimental population is not essential to the continued existence of the species in the wild. The Service has prepared an environmental assessment of the proposed action, as required by the National Environmental Policy Act of 1969. The Service has also prepared a biological opinion under section 7 of the Act. The biological opinion concludes that the proposed action is not likely to jeopardize the continued existence of the black-footed ferret.

The Service has developed a Memorandum of Agreement and Conservation Plan for the black-footed ferret in Wyoming. The Memorandum of Agreement and Conservation Plan was signed by the Service, Wyoming Game and Fish Department, Bureau of Land Management, and the Wyoming Governor's Office. The Memorandum of Agreement and Conservation Plan provides for the establishment of a nonessential experimental population of black-footed ferrets in Shirley Basin, Carbon County, Wyoming. The Memorandum of Agreement and Conservation Plan also provides for the management of the nonessential experimental population according to the provisions of section 10(j) of the Act.

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